附件一、技術推廣表

高頻資料特徵工程與設備健康指標模組

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市場及需求:

對於製造業設備健康管理(PHM)與預測保養(PdM)建構人工智慧預測模型能有效提升預測準確度。

技術摘要:

高頻訊號進行特徵工程，透過時域、頻域、頻譜圖的線性與非線性特徵萃，並進行重要特徵挑選後，建構健康指標特徵的相關檢定，以利設備健康指標建構。

優勢:

透過大量特徵的轉換，找出真正影響機台設備老化現象的相關特徵。

競爭產品:

市面上有許多 PHM 產品，各家方法與客製化的產業別不一。

相關研究經驗:

(1)本研究團隊具有數十年研究經驗

(2) Lee, Chia-Yen, Huang, Ting-Syun, Liu, M.-K., and Lan, C.-Y., 2019. Data science for vibration heteroscedasticity and predictive maintenance of rotary bearings. Energies, 12 (5), 801.

Lu, Hsuan-Wen, and Lee, Chia-Yen, 2022. Kernel-based dynamic ensemble technique for remaining useful life prediction. IEEE Robotics and Automation Letters, 7 (2), 1142-1149.

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Equipment Health Indicators Module

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Market Needs: Improve prediction accuracy of artificial intelligence models for prognostic & health management (PHM) and predictive maintenance (PdM) of equipment in the manufacturing industry

Our Technology: Feature engineering for high-frequency signals. Through linear and nonlinear feature extraction in time domain, frequency domain, and spectrogram, the important features are extracted and identified. After statistical testing of these features for equipment health indicator, the selected features benefit the construction of equipment health indicators.

Strength: Through the extraction of a large number of features, identify the relevant features that really affect the aging or degradation of the equipment

Competing Products: There are PHM products in the market and each product is customized for some specific industrial applications.

Relevant research experience:
(1) The research team has decades of research and practical experience
(2) Lee, Chia-Yen, Huang, T.-S., Liu, M.-K., and Lan, C.-Y., 2019. Data science for vibration heteroscedasticity and predictive maintenance of rotary bearings. Energies, 12 (5), 801.
Lu, H.-W., and Lee, Chia-Yen, 2022. Kernel-based dynamic ensemble technique for remaining useful life prediction. IEEE Robotics and Automation Letters, 7 (2), 1142-1149.

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